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Is Co-Management Still Feasible to Advance the Sustainability of Small-Scale African Inland Fisheries? Assessing Stakeholders' Perspectives in Zambia

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Abstract: Co-management has been promoted as an alternative approach to the governance of small-scale inland fisheries resources and has been implemented in many African countries. It has, however, not proven to be a simple solution to improve their governance; hence, most African inland fisheries are still experiencing unsustainable overexploitation of their resources. As such, there is a need for reassessing the application of governance strategies for co-management that should strive to strengthen the participation of stakeholders, primarily the local fishers, as they are fundamental in the governance of fisheries resources. Therefore, this study set out to explore the prospects of a co-management governance approach at a Lake Itzhi-Tezhi small-scale fishery in Zambia. Focus group discussions with fishers and semi-structured interviews with other stakeholders were used to collect data. This study revealed that the stakeholders perceive co-management as a feasible approach to governance of the Lake Itzhi-Tezhi fishery. However, the feasibility of the co-management arrangement would be dependent mostly on the stakeholders' ability to address most of the 'key conditions' criteria highlighted in the study. This study also identified the need to establish a fisheries policy to provide guidelines for the co-management, coming with decentralisation of power and authority to the local fishers.

Keywords: co-management; fisheries governance; key conditions criteria; small-scale inland fisheries; stakeholders' perceptions; Zambia



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1. Introduction

To advance sustainability, most Sub-Saharan African countries with small-scale inland fisheries have been instituting policy and legislative frameworks that promote some decentralisation of power, authority, and responsibilities from the central government to the local community through co-management reforms [1–3]. These governance reforms were instituted to address the many failed top-down, central government-controlled governance systems that had been in place in several African countries [1,4–6]. These failed governance systems contributed to the decline in the inland fisheries resources over the past years in most of these African inland water bodies [7]. Since the 1990s, fisheries co-management has been viewed as an alternative and appropriate governance strategy in several African countries to address such a predicament [6,8,9].

There is no uniform definition of the term 'co-management', but in the context of fisheries, it can be understood as "a partnership arrangement in which the community of local resource users, government, other stakeholders, and external agents share the responsibility and authority for the management of the fishery" [10] (p. 7). Integration of stakeholders at multiple levels in the co-management design and implementation process

is therefore considered to be a significant component of the process [11]. An essential aspect of the reforms leading towards co-management has been the assumption that the livelihoods of the local resource users could be improved primarily by improving the status of the fisheries resources through their participation in the governance process [12].

Despite this understanding and assumption, the co-management approaches have not proven to be the silver bullet for rectifying governance problems in the African inland fisheries sector but have shown mixed results depending on the different strategies and approaches taken by different countries. Svendrup-Jensen and Nielsen [6] and Béné et al. [4,13] observed that very few of these failures and successes had to do with the status of the fish stock itself but were related to various types of governance flaws. For instance, in their review of fisheries co-management in Cameroon, Niger, Nigeria, Malawi, and Zambia [13] observed that, in the decentralisation process, the power remained to a greater extent with the central government. This scenario was so because the transfer of power and responsibilities was mainly carried out by local government instead of local fishing communities, thereby defeating the original purpose of the reforms. Furthermore, studies on institutions and co-management on Lake Victoria and lakes in Malawi revealed that the relationships between the local fisheries communities, traditional authorities, and government fisheries officials were generally not equal in terms of authority and power-sharing, application of the legislation, and access to resources [3].

It was expected that the introduction of fisheries co-management would have enhanced cooperation among stakeholders and resulted in equal relationships, with trust being critical to the success of collaboration in the governance process, but that has not been the case in several fisheries [3,8,14–16]. Given the challenges co-management has experienced as an approach to governance in African inland fisheries, it becomes important to question the viability of the strategy and explore its present feasibility.

This study took the case of Zambia, a landlocked southern African country, which applied co-management in the 1990s as an approach of governance for its main fisheries. The results then were mixed but unsuccessful for most fisheries, primarily due to weak institutions, lack of effective stakeholder participation, and absence of the legislative framework to support the co-management approach [17]. The enactment of the Fisheries Act (22 of 2011) legislation that supports a fisheries co-management approach was meant to provide a platform to explore a possible resurrection and facilitation of co-management in Zambian fisheries [18]. It is therefore pertinent to assess the perceptions of the key stakeholders with regard to how this change in fisheries legislation can impact possible fisheries management strategies and to follow up on the policy objectives of an effective and functional fisheries co-management.

Since co-management is about sharing power, the perceptions of stakeholders are an important part of the feasibility of the co-management approach. It is furthermore important to understand the conditions required for establishing and sustaining successful co-management of fisheries resources [19]. The 'key conditions' for successful common-pool resources (CPR) such as fisheries, initially developed by Ostrom [20,21] but later expanded and adapted to fisheries resources [22], were used as a framework in this study. These 'key conditions' were used as design principles for assessing the possible success of the fisheries co-management arrangement at Lake Itzhi-Tezhi based on the stakeholders' perceptions.

This study, using the Lake Itzhi-Tezhi fishery of Zambia as a case, contributes to the ongoing debate on the viability and effectiveness of designing and implementing a co-management approach to enhance sustainability in small-scale inland fisheries [13,23,24]. The objective of this study was to explore the prospects of a co-management approach, inclusive of multiple stakeholders. The following research questions are addressed:

1. Who are stakeholders and what are their roles in the Lake Itzhi-Tezhi fishery?
2. What are the stakeholders' perceptions of the feasibility of a co-management arrangement for the Lake Itzhi-Tezhi fishery?
3. How would the 'key conditions' for successful co-management be able to address the stakeholders' perceived challenges and benefits?

Zambia's Fisheries and Co-Management

The Zambian fisheries sector has eleven main fisheries which contribute 3.2% to Zambia's Gross Domestic Product (GDP) [25]. However, as of 2015, Zambia's estimated fish consumption demand was 185,000 metric tonnes compared with a local production of about 100,000 metric tonnes, which meant that the deficit was still being imported [26]. From the British colonial era, governance and management of the fisheries has primarily been done by the central government through various strategies—namely, closed fishing seasons, closed breeding areas, the prohibition of particular methods and gear, restrictions on mesh sizes, and limiting the number of fishers in any given fishery through the issuance of fishing licences [27–29]. However, these strategies have not been successful in preventing overexploitation of resources in almost all the fisheries [30].

Given this scenario, Zambia has been working on fisheries co-management during the last decades with mixed results [17]. This goes back to fishing sector reforms in the 1990s in response to its underperformance and decline in fisheries resources. The reforms instituted new governance frameworks in fisheries intending to promote more effective, sustainable, and legitimate fisheries governance by changing and sharing responsibilities between the central government and local actors and institutions. The fisheries co-management reforms were initiated at Lakes Mweru, Bangweulu, Kariba, and Tanganyika, but faced several challenges which mostly led to their unsuccessful implementation and sustainability [13,17,31]. Some of these challenges encountered included lack of legislation to support the execution of co-management reforms, poorly equipped extension services to design locally accountable devolved institutions, the prevalence of conflicts of interest among different stakeholders, and reluctance by the central government to relinquish certain responsibilities and pass them on to local resource users [13,31]. As such, with fisheries being common-pool in nature and government-owned by law, the resources in these lakes continued to be overexploited [17,32,33].

Given this predicament, the Zambian government decided to review and enact some legislative frameworks and policies to incorporate local community participation and stakeholders' engagement in the governance of the fisheries resources in the inland small-scale fisheries. Some of the legislative frameworks and policies instituted which covered the fisheries sector to achieve this purpose included the Fisheries Act (22 of 2011) [18], Wildlife Act (14 of 2015) [34], National Policy on the Environment of 2007, National Decentralisation Policy of 2017, National Development Policy of 2012, and the National Agriculture Policy of 2015. The Department of Fisheries (DoF) adopted the National Agriculture Policy of 2015 as an applicable and practical policy guide in its operation. Despite the availability of legislative and some policy provisions for the sector, implementation of a functional co-management governance process and structure has still been a challenge in the Zambian fisheries sector [31,35–37]. For instance, as of 2016, Lake Itzhi-Tezhi had no co-management in place but a dual governance approach in the form of a fishing community-based approach and central government-controlled approach. Both approaches were ineffective, mainly due to a lack of adherence to the legislation for local community participation in fisheries governance and an inadequate policy framework to guide the governance process [23]. Therefore, this study explored further a legitimate and functional co-management governance approach for the Zambian fisheries sector which would incorporate different stakeholders in its operation.

2. Materials and Method

2.1. Framework for Analysis of Successful Common-Pool Institutions

The locus of this study is within the scholarship of governance of common-pool resources (CPR), natural resources that are characterized by rivalry in consumption and by being costly to exclude other users [38]. Such a resource environment is characterised by an open-access problem, hence a risk of tragic outcomes of overuse if unattended to by an effective governance strategy [20,39]. The Lake Itzhi-Tezhi fishery of Zambia, a case of African inland CPR, has been under the governance of a centralised government

system that has not been effective in preventing overexploitation of the common fisheries resources [23]. The CPR theory focuses on the ability of stakeholders to collaborate in overcoming governance challenges inherent to common-pool resources [38,40].

The criteria of ‘key conditions’ for successful CPR institutions was employed for this study. These ‘key conditions’ criteria were initially developed by Ostrom [20,21] as design principles to help in understanding the attributes of effective CPR governance systems and gaining compliance with the rules over generations. The ‘key conditions’ criteria, based on the work of Ostrom, were further elaborated and expanded by Pomeroy, Katon, and Harkes [22] (Table 1) for assessing the success of co-management arrangements in various inland and coastal fisheries. Different scholars have since used these ‘key conditions’ as an analytical framework (Table 1) for that purpose [19,41–43]. This study assessed the stakeholders’ perceptions of the feasibility of an envisaged co-management at the Lake Itzhi-Tezhi fishery using these ‘key conditions’ criteria. The ‘key conditions’ were linked to the stakeholders’ perceived challenges and the benefits of co-management.

Table 1. The ‘key conditions’ criteria for successful fisheries co-management.

Serial No.	Criteria	Rationale
i	Clearly defined boundaries	Boundaries of the area to be managed are distinct so that the fishers can have accurate knowledge of them.
ii	Membership is clearly defined	Individual fishers with rights to fish in the bounded fishing area and participate in area management are clearly defined.
iii	Group cohesion	Fisher group, with homogeneity in terms of ethnicity, permanently resides near the area to be managed.
iv	Existing organisations	Fishers have some prior experience with traditional community-based systems and with organisations.
v	Benefits exceed costs	Individual fishers expect that the benefits to be derived from participation in community-based management will exceed the costs of investments in such activities.
vi	Participation by those affected	Most individuals or organisations affected by the management arrangements are included in the governance structure.
vii	Management rules enforced	Monitoring and enforcement are effected and shared by all fishers and other stakeholders.
viii	Legal rights to organise	There is enabling legislation from the government defining and clarifying local responsibility and authority.
ix	Cooperation and leadership at a community level	There is an incentive and willingness on the part of local fishers to actively participate in fisheries management.
x	Decentralisation of authority	The government has established a formal policy for decentralisation of administrative and management responsibilities and authority to local group organisation levels.
xi	Coordination between government and community	A coordinating body is established, with representation from the fisher group and government, to monitor the fisheries management arrangements.

Source: Pomeroy, Katon, and Harkes [22,42].

2.2. Stakeholders Identification and Analysis

Co-management is one approach to solving CPR management problems through partnerships among different stakeholders [11,36]. In the context of natural resource management, Pomeroy and Rivera-Guieb [10] defined stakeholders as “individuals, groups or organisations who are, in one way or another, interested, involved or affected (positively or negatively) by a particular project or action toward resource use”. Stakeholders may originate from geographical proximity, historical association, dependence for livelihood, institutional mandate, economic interest, or a variety of other concerns [10,44]. In the co-management of fisheries resources, they may include fishers and their households, government agencies, boat owners, fish traders, community-based groups, local business owners, local traditional authorities, representatives of non-governmental organisations (NGOs), private firms, and others [10]. However, not all stakeholders have the same level of interest in the co-management of fisheries resources. There are primary stakeholders

who assume a more active role in the governance and management of the resources. There are also secondary stakeholders who simply play consultative roles and provide other needed resources in the process [45]. In this study, the primary and secondary stakeholders were identified around the Lake Itzhi-Tezhi fishery, and their general roles at the fishery were analysed.

2.3. Study Site

The human-made Lake Itzhi-Tezhi lies on the Kafue River in the Southern province of Zambia at $15^{\circ}44'19''$ S– $26^{\circ}02'17''$ E in the Itzhi-Tezhi district (Figure 1; See also [46]). It was created by a large dam that was built in 1977 [47,48]. A large portion of the lake is in the Kafue National Park (Figure 1) and under the jurisdiction of the Department of National Parks and Wildlife (DNPW), as stipulated under the Wildlife Act (14 of 2015) [34]. Four chiefdoms are within the vicinity of the lake—namely, Kaingu, Shimbizi, Musungwa, and Shezongo. The fishers that ply their trade on the lake reside in these chiefdoms. The district houses different government and private offices with an interest in the wellbeing of the Lake Itzhi-Tezhi fishery.

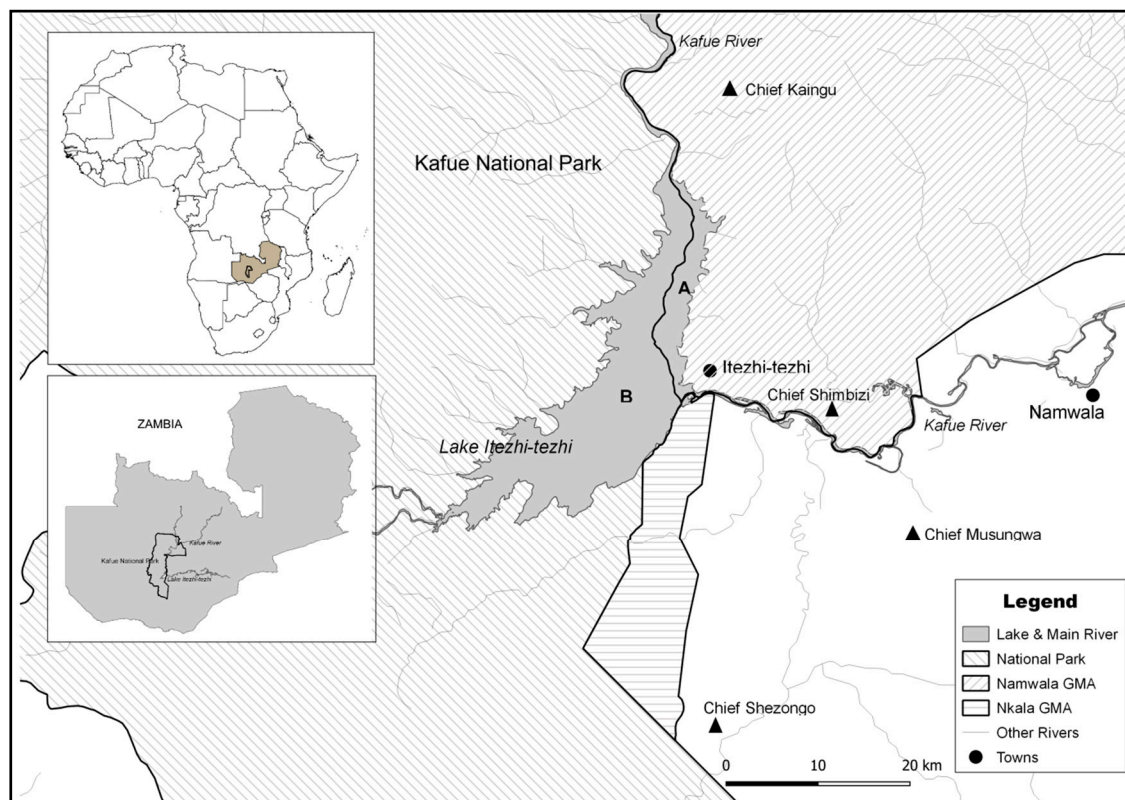


Figure 1. Map showing Lake Itzhi-Tezhi, Kafue National Park, and chiefdoms (Source: Own illustration). A—Section of the lake that lies outside the Kafue National Park; B—Section of the lake that lies within the national park; GMA—Game Management Area.

2.4. Data Collection and Analysis

Qualitative data were collected in the study area between March and July 2016. A participatory approach through focus group discussions (FGDs) with fishers and semi-structured interviews with other stakeholders in the fishery was used [49]. Since the characteristics of fishers and the set-up of the fishery are heterogeneous in relation to distance and accessibility to the fishing sites from homesteads, a proportionate quota sampling method was used [50]. This type of sampling helped to determine relatively homogenous sample sizes of fishers from 3 strata of the fishery that comprised fishing villages and fishing camps.

Focus groups from the 3 strata were purposefully selected based on the availability of fishers in each of the 40 fishing villages and fishing camps (Table 2). These FGDs, each consisting of about 10 purposely selected adult respondents (≥ 18 years old), were conducted in all the 3 strata [51]. In stratum three, comprising fishing villages only, 3 of the 4 FGDs had a mixture of men and women, and the remaining one had males only. All the FGDs in the other strata, 1 and 2, were composed of males only, as they were conducted in the fishing camps. These fishing camps were only accessed by male fishers, hence the composition of the FGDs. The principal researcher was the facilitator for all the FGDs for uniformity purposes in data collection. The FGDs comprised semi-structured questions [51].

Table 2. Composition of the strata for the Lake Itzhi-Tezhi fishery.

Strata	Number of Sampled Fishing Camps and Fishing Villages in Each Stratum	Number of Focus Group Discussions in Each Stratum
Stratum 1	17	5
Stratum 2	10	3
Stratum 3	13	4
Total	40	12

Furthermore, semi-structured interviews were conducted with 17 participants from 11 stakeholders (organisations) at the fishery to gather additional information on the subject and confirm earlier views gathered from FGDs [51] (Table 3). The stakeholders within the Itzhi-Tezhi District comprised the central government ministry and departments (fisheries, livestock, wildlife, and agriculture), Fishermen and Fish Traders Association (FFTA), local government, the District Commissioner's office, a Non-Governmental Organisation, private firms, traditional leaders, and ex-fishers. Purposive sampling, based on their expertise and experience on the subject under discussion, was used to select the stakeholders for interviews [51].

Table 3. Interviewees from different stakeholders.

Serial Number	Stakeholders	Interviewees
1	Department of Fisheries	2
2	Department of National Parks and Wildlife	1
3	Ministry of Agriculture	1
4	Department of Livestock	1
5	Local government	1
6	District Commissioner's Office	1
7	Private organisations	2
8	Non-governmental organisations (NGOs)	1
9	Fishermen and Fish Traders Association (FFTA)	1
10	Kaingu chiefdom headmen	4
11	Ex-fishers	2
	Total	17

The overarching themes for interviews and FGDs were stakeholders' current roles at the Lake Itzhi-Tezhi fishery, their perceptions on the feasibility of co-management arrangement, and their expected challenges of and benefits from the co-management governance arrangement.

Furthermore, a demographic profile of 451 fishers, from a population of 1800 fishers that plied their trade at Lake Itzhi-Tezhi fishery, was captured to determine the characteristics of the fishing community under discussion. The quantitative data collected, through a semi-structured questionnaire, included their education levels, marital status, age groups, ethnic groups, residential status, and sources of livelihood.

Qualitative data collected were analysed through the development of themes and sub-themes from the transcribed scripts, coding the participants' responses and linking

them to the different themes created, and then analysing the content qualitatively and quantitatively [52]. Quantitative data were analysed using the Statistical Package for Social Sciences software (SPSS), and percentages were produced for each parameter. Reliability and validity were addressed through methodological triangulation—that is, using different sources of data (focus group discussion with fishers and stakeholder interviews) [53] and the quota sampling technique.

3. Results

3.1. Demographic Profile of Fishers in the Lake Itzhi-Tezhi Fishing Community

Based on the demographic profile of the 451 fishers captured, the Lake Itzhi-Tezhi fishing community had characteristics as shown in Table 4. Furthermore, of the 71% immigrant fishers from different parts of the country, 78% comprised fishers who had permanently settled in the fishing community, while 22% had not, as they had homes elsewhere. Of all the ethnic groups among fishers in the area, only 8% were the indigenes, and these were the Ila. The rest were immigrant ethnic groups. Almost all the fishers (98%) depended on fishing in the lake as their major source of livelihood.

Table 4. Demographic characteristics of fishers in Lake Itzhi-Tezhi fishing community.

Demographic Profile of Fishers		%
Education levels	Completed primary education and below	86
	Not completed secondary education	10
	Completed secondary education	4
Marital status	Married	71
	Single	21
	Widows, widowers, divorced	8
Age groups	18–40 years	65
	Above 40 years	35
Ethnic groups	Lozi	31
	Luvale	23
	Bemba	19
	Ila	8
	Others	19
Residence	Immigrant fishers	71
	Resident fishers	29

Note: $n = 451$ (Survey).

3.2. Stakeholders at the Lake Itzhi-Tezhi Fishery and Their Roles

The primary stakeholders identified included fishers, government agencies (namely, the Department of Fisheries (DoF) and the Department of National Parks and Wildlife (DNPW)), traditional authorities, the Fishermen and Fish Traders Association (FFTA), and a non-governmental organisation (Game Rangers International (GRI)) (Table 5). One of the roles of the DNPW was to ensure that no person accessed the fisheries resources in the lake without a park entry permit; this was intended to prevent indiscriminate harvesting of the resource. The DoF was also mandated to manage and conserve the fisheries resources of Lake Itzhi-Tezhi under the Fisheries Act (22 of 2011) of the Laws of Zambia. The mandate was mainly carried out through enforcement of the closed fishing season every year between December and February and the prohibition of the use of illegal fishing gear and methods during the fishing season. Therefore, the two government departments were expected to collaborate in the conservation and management of the fisheries resources, especially during the closed fishing season.

Table 5. Main stakeholders and their roles at the Lake Itzhi-Tezhi fishery.

Type of Stakeholders	Stakeholders	Their General Roles around Lake Itzhi-Tezhi
Primary	Fishers	Fishing and fish trading.
	Department of Fisheries	Management and conservation of fisheries resources. Enforcement of fisheries laws and regulations.
	Department of National Parks and Wildlife	Management and conservation of wildlife in protected areas (Kafue National Park and Game Management Areas). Enforcement of wildlife laws and regulations.
	Fishermen and Fish Traders Association	Concerned with the fishing activities and welfare of fishers and fish traders.
	Non-Governmental Organisation (GRI)	Assisting the wildlife authorities and communities in the Kafue National Park area to better protect this valuable resource and its environment.
Secondary	Traditional Leaders	Dispute settlement, enforcement of customary laws, arrangement of ceremonies, organisation of communal labour, and promotion of socio-economic development.
	Itzhi-Tezhi District Council	Delivering services in relation to roads, planning, housing, economic and community development, environment, recreation, and amenity services.
	Ministry of Agriculture	Providing technical guidance to farmers in the crop production sector.
	Department of Livestock Development	Providing technical guidance to farmers to enhance sustainable development in the livestock sector.
	Zanaco	National commercial bank offering financial services for the Itzhi-Tezhi district.
	Zesco	Producer and supplier of hydroelectricity at Lake Itzhi-Tezhi dam and provision of community services in the district. In addition, providing community services in the district.
	District Commissioner's office	District administration of various activities in the Itzhi-Tezhi district.

Source: Stakeholder interviews, focus group discussions [18,34].

The fishing villages along the lake were under the traditional governance of four prominent chiefs—namely Kaingu, Musungwa, Shimbizi, and Shezongo. Several headmen (i.e., a man who is a leader of a village in a chiefdom) in these chiefdoms assisted the chiefs in the running of the daily affairs in these villages. Therefore, under customary laws, all the fishers were accountable to the chiefs and headmen in these villages where they resided, as they conducted their fishing activities in the lake to earn a living. The fishing community comprised immigrant and resident fishers (Table 4) who conducted their fishing and fishing-related activities based on access rights they had to the fishing sites on the lake during the fishing season (March to November). Access to fishing sites and withdrawing of fish from those sites was only possible through the park entry permits and fishing licences issued by DNPW and DoF, respectively. No person was permitted to catch fish during the closed fishing season. The fishing community had a Fishermen and Fish Traders Association (FFTA), registered with the Zambian Registrar of Societies. The intention of the association was for every fisher and fish trader to be a registered member to attend to their wellbeing effectively.

Secondary stakeholders (Table 5) included government agencies, such as the Department of Agriculture and the Department of Livestock, the Itzhi-Tezhi District Council (local government), the District Commissioner's office, and two private firms. Their roles at the fishery are also shown in Table 5. The stakeholders' roles generally range from fishing and fish trading to fisheries resource conservation and provision of technical support and services, among others.

3.3. Stakeholders' Perceptions of the Feasibility of a Co-Management Arrangement

Fishers' perceptions through all the FGDs were that co-management was a welcome approach to advance sustainable fishing of the fishery's resources and livelihood improvement. They expressed the view that neither the government nor the fishers were able to govern the fishery effectively on their own because of the limited resources and capabilities. They indicated that they were in a strategic position to participate, as they were knowledgeable about each other and the fishery.

In agreement with the fishers, the DoF officials through interviews stated that it had been a great challenge, because of their limited resources, to enhance sustainable fishing of fisheries resources, hence the overexploitation of the fishery's resources over the years. A need for collaboration with other stakeholders through a co-management initiative was expressed as an option to prevent further resource overexploitation. Their focus was to have the full participation of the fishers, being the primary resource users.

The other stakeholders (local government, the Non-Governmental Organisations (NGOs), private firms, and some government ministries and departments), through interviews, also expressed the need for them to be part of the co-management initiative, as fish from the lake was the primary source of income, employment, and food and nutrition for the fishing community and the other inhabitants of the Itezhi-Tezhi district.

The justification by the stakeholders, as regards co-management being an alternative approach in the governance of the Lake Itezhi-Tezhi fishery, was based on the success in deriving certain benefits from the co-management arrangement. There are also challenges that can be addressed through certain 'key conditions' being in place.

3.4. Stakeholder Perceptions of Perceived Challenges and Benefits of a Successful Co-Management Arrangement

3.4.1. Analysis of 'Key Conditions' Criteria That Address Expected Challenges for Successful Co-Management

Through the focus group discussions and interviews, fishers and other key stakeholders (DoF, DNPW, FFTA, NGO, and traditional authorities) highlighted some expected challenges that needed to be addressed during the development and implementation of co-management (Table 6). Some challenges identified by the fishers and the key stakeholders were the need for capacity building among fishers, conflicts or lack of cooperation among fishers, and lack of cooperation between fishers and other stakeholders during the implementation process. They also identified the possible lack of financial input for the co-management implementation to be a likely challenge to address. Additionally, the other key stakeholders perceived the lack of visible benefits accruing to fishers during the co-management undertaking to be a source of discouragement for their full participation.

The co-management challenges identified by the primary stakeholders would be addressed by fulfilling certain 'key conditions' criteria, thus enhancing the possible success of the co-management arrangement (Table 7). For instance, (i) the lack of cooperation among fishers and fishery's stakeholders would be addressed by fulfilling the 'key condition' in defining clear fishing boundaries on the lake between the fishing area for fishers and the Kafue National Park (a no-fishing area unless issued a national park permit); (ii) the lack of an effective voice for the fishers' needs would be addressed by fulfilling the 'key condition' of having a clearly defined membership registration and monitoring system for fishers. Similarly, 'key conditions' (iii), (v), (viii), (x), and (ix) would help to address the other expected co-management challenges (Table 7).

Table 6. Expected challenges in co-management: fishers' and other primary stakeholders' perspectives at the Lake Itzhi-Tezhi fishery.

Expected Challenges	Fishers' Priority ^a	Other Primary Stakeholders' Priority ^b
Need for a voice for fishers	+++	+++
Need for awareness to participate in law enforcement	+++	+
Need for capacity building among fishers	+++	+++
Need for visible benefits to fishers	0	+++
Conflicts and lack of cooperation among fishers (if co-management arrangement not correctly understood)	+++	+++
Conflicts and lack of cooperation between fishers and other stakeholders	+++	+++
Conflicts among stakeholders (not with fishers)	0	+
Presence of elite capture	0	+
Need for financial input for co-management implementation	++	+
Mistrust among stakeholders	+	+
Increased immigrants among fishers	0	+

Note: ^a: Based on the extent to which a role was expressed in the strata and the FGDs. +++—Expressed in all the strata (100%) and among most FGDs (>50%). ++—Expressed in all the strata (100%) but in fewer FGDs (<50%) in the strata OR in two strata (>65%) but among most FGDs (>50%) in all the strata. +—Expressed in one or two strata (<65%) and in less of the FGDs (<50%) in a stratum. 0—No comment. ^b: Based on comments from key stakeholders directly attached to the fishery (DoF, DNPW, traditional authorities, NGO, and FFTA): +++—Comments from at least four stakeholders. ++—Comments from three stakeholders. +—Comments from one or two stakeholders. 0—No comment.

Table 7. 'Key conditions' to help address all the primary stakeholders' perceived challenges for the possible success of co-management at the Lake Itzhi-Tezhi fishery.

Serial No.	'Key Conditions'	Perceived Challenges by Fishers	Perceived Challenges by Other Primary Stakeholders
i	Clearly defined lake boundaries	Conflicts and lack of cooperation between fishers and other stakeholders because of undefined lake boundaries.	
ii	Membership clearly defined	Need for an effective FFTA to be a voice for all registered fishers.	Need for a reliable FFTA to be a voice for all registered fishers; the need for proper registration and monitoring of fishers.
iii	Group (fishers') cohesion	Conflicts and lack of cooperation amongst fishers themselves if co-management arrangement is not understood correctly.	Conflict and lack of cooperation amongst fishers themselves if co-management arrangement is not understood correctly.
v	Benefits exceed costs	Need for financial input to operationalise co-management may lead to high transaction costs.	Likely failure to realise benefits accruing to the fishers because of high transaction costs.
viii	Legal rights to organise co-management	Need for awareness for fishers to participate in law enforcement through co-management.	Need for awareness for fishers to participate in law enforcement through co-management.
x	Decentralisation of authority	Lack of capacity to govern the fishery by themselves; the need for stakeholders' assistance.	Lack of capacity to govern the fishery by themselves; the need for stakeholders' assistance.
ix	Cooperation and leadership at the community level	Lack of cooperation amongst fishers themselves if co-management arrangement is not understood correctly.	Lack of cooperation amongst fishers themselves if co-management arrangement is not understood correctly.
		Need for building capacity among the majority of fishers resulting from their low educational levels.	Need for capacity building among fishers in leadership skills and other aspects.

Note: Serial numbers in this table are aligned with those in Table 1 for consistency's sake.

3.4.2. Analysis of ‘Key Conditions’ That Highlight Benefits for the Success of the Co-Management

Through FGDs and interviews, all the primary stakeholders envisaged some benefits that would filter down to fishers’ households, the other fishery stakeholders, and the fishery at large (Table 8). Some benefits identified by all the primary stakeholders were that co-management could provide a voice for fishers through the FFTA and increased stakeholder support of fisheries governance. Additionally, the fishers and a few primary stakeholders identified effectiveness in law enforcement, increased fish stock, and increased fish catches as other critical benefits.

Table 8. Benefits for the sustainability of the governance approach: all the primary stakeholders’ perspectives at the Lake Itzhi-Tezhi fishery.

Benefits	Fishers’ Priority ^a	Other Primary Stakeholders’ Priority ^b
A voice for fishers through the FFTA	+++	+++
Effective law enforcement	+++	+
Increased fish stocks	+++	+
Increased stakeholder support	++	+++
Increased income through other sources	++	0
Improved fishers’ livelihood	0	++
More income sources for FFTA	++	0
Increased fish catches	++	+
Increased income through fishing	+	0
Benefits to future generation	0	+

Note: ^{a, b}: Refer to Table 6 for the meaning of these superscripts, the plus signs and 0 signs.

The expected benefits would be realised by fulfilling the appropriate ‘key conditions’ for enhancing the success of the co-management (Table 9). For instance, (iv) the FFTA had been in existence at the fishery representing the fishers since 2009 and was therefore related to a ‘key condition’ of an existing organisation (association) at the fishery—an indication of fishers’ ability to mobilise themselves for co-management; (v) increased fish catches, increased fishing income, increased alternative sources of income, and improved livelihoods were related to a ‘key condition’ of ensuring these benefits exceeded investment and transaction costs during implementing co-management. Similarly, ‘key conditions’ (vii), (ix), and (xi) would help to realise the other expected benefits (Table 9).

Table 9. ‘Key conditions’ for co-management that would help realise all the primary stakeholders’ expected benefits at the Lake Itzhi-Tezhi fishery.

Serial No.	Key Conditions	Fishers’ Perspectives	Other Primary Stakeholders’ Perspectives
iv	Existing organisations	FFTA-has been representing all fishers and can still play that role if well organised.	FFTA-has been representing all fishers and can still play that role if well organised.
v	Benefits exceed costs	Promote increased fish catches by fishers.	Promote increased fishers’ household income from several sources due to stakeholders’ input.
		Promote increased income sources as other stakeholders would ensure fishers were assisted.	Improve the livelihoods of fishers’ households expected.
vii	Management rules enforced	Collective enforcement of fisheries laws and regulations by fishers and other responsible stakeholders (DoF and DNPW).	
ix	Cooperation and leadership at the community level	Cooperate between fishers and other stakeholders to address governance challenges currently being faced (i.e., fishery governed primarily by the government).	
xi	Coordination between government and community		Proposed organisational structure to increase stakeholders’ support with their expertise.

Note: Serial numbers in this table are aligned with those in Table 1 for consistency’s sake.

4. Discussion

4.1. Stakeholders' Roles and Perceptions of Fisheries Co-Management

The inclusion of multiple stakeholders due to their different roles in the governance of the Lake Itzhi-Tezhi fishery seemed to be critical to the feasibility of an effective co-management governance if adopted. This is because the primary stakeholders were already involved in the governance and management of the fishery, hence their suitability in contributing greatly to the fisheries co-management approach in terms of technical knowledge, administrative capabilities, and law enforcement skills. The inclusion of secondary stakeholders would be beneficial in providing financial and material support towards the fishers' alternative livelihoods during the co-management governance arrangement. These findings are in line with the study by Kapembwa et al. [46] on the Lake Itzhi-Tezhi fishery, who suggested the development or enactment of the right livelihood-tailored fisheries policies and legislative frameworks that would compel the incorporation of appropriate stakeholders in fishers' livelihoods to promote sustainable fishing. The study by Kapembwa et al. [46] is supported by that of Chama and Mwitwa [35] on the Lake Bangweulu fishery in the northern part of Zambia, who recommended the formulation of a policy on fisheries management that should focus on uplifting the livelihood of local communities while conserving the fisheries resources.

The stakeholders' perceptions largely entail that co-management is applicable for the governance of Lake Itzhi-Tezhi fishery, given that it will be adequately guided by the provisions of the legislation and the engagement of stakeholders. This finding is in line with the arguments put forward by Pomeroy and Williams [54] and d'Armengol et al. [55] that the different structural components in a co-management arrangement should be entrenched through the necessary legislation to make operational and collective decisions in the fishery. The current study also agrees with the argument by Carlsson and Berkes [11] that, in order to foster the success of co-management, it should be defined in formalised arrangements, where multiple stakeholders share governance functions and responsibilities on a given fishery. Wilson et al. [12] added that a centralised government approach has resulted in a significant barrier to integrating decision-making from other stakeholders in fisheries governance and management. As such, the different stakeholders in this study advocated for multiple stakeholder participation in the co-management governance arrangement of the Lake Itzhi-Tezhi fishery.

There is a further need for an appropriate policy to guide such a co-management arrangement. The current National Agriculture Policy (2015–2030) adopted by the Department of Fisheries (DoF) does not provide adequate guidelines, as it does not provide details on how co-management should be organisationally structured and implemented. If such a policy is not in place, there will be a great risk for conflicts and confusion around defining and delineating the roles and mandates of key actors [56]. This study also argues that the lack of a properly defined policy framework on co-management could be a further reason why the government, through DoF, has been struggling to make progress on the issue of co-management implementation as demanded by the Fisheries Act (22 of 2011) [18]. To date, there has been no proper co-management arrangement on any Zambian fishery that is operating based on the requirements of the Fisheries Act, though there have been collaborative or participatory management arrangements between government and fishing communities on some fisheries [57,58]. Some of such fisheries are the Lake Mweru-Luapula fishery and Lake Bangweulu fishery in the northern part of Zambia, whose performance in terms of collaborative or participatory fisheries governance was still not pleasant. This was so because the local fishers and other key stakeholders were still not engaged in decision-making about the governance of the fishery [35,37]. Furthermore, power and authority still resided with the central government on both fisheries [35,37].

4.2. Relating the Stakeholder Perceptions on Perceived Challenges and Benefits to the 'Key Conditions' Criteria for Successful Fisheries Co-Management

Studies on existing co-management arrangements in Asia, the South Pacific, and Africa have shown that small-scale fishers can manage fisheries resources sustainably by fulfilling certain 'key conditions' [22,54]. This study conducted a 'pre-assessment of co-management' based on stakeholders' perceptions aligned to the 'key conditions' in order to ascertain the feasibility of undertaking what they would regard as a successful co-management at the Lake Itzhi-Tezhi fishery. The study indicates the need to fulfil most of the eleven 'key conditions' in undertaking co-management in order to address the challenges and realise the benefits highlighted by the stakeholders. These 'key conditions' should be fulfilled because none of them exists in isolation, but each one supports and links to another to make the process and arrangements for the co-management work [22].

(i) Clearly defined boundaries: Having clearly defined physical boundaries around a fishery is essential in preventing conflicts between fishers and government authorities. Although a large part of Lake Itzhi-Tezhi was well defined in terms of physical boundaries, the boundary between the lake portion inside the Kafue National Park and the portion outside the park was still unclear and was a source of conflict. To avoid further conflict which may jeopardise co-management goals, the Department of National Parks and Wildlife (DNPW) would need to demarcate the contentious boundary.

(ii) Membership clearly defined: Membership of fishers on the fishery was not clearly defined because of the open-access nature of the fishery and the inefficiency of the Fishermen and Fish Traders Association (FFTA) in organising the fishers. Therefore, one option for defining membership would be to strengthen the fishing licensing process for fishers by the DoF, which would act as an inventory and monitoring tool for active fishers. A fisher is not permitted to fish in the lake without a fishing licence issued by DoF yearly, in accordance with the Fisheries Act of 2011(22 of 2011) [18]. Fishers would be required to cooperate and collaborate with the DoF to make this operational. As was the case with the Beach Management Unit (BMU) on Lake Victoria [25], the Fisheries Management Committee (FMC) earmarked for establishment would also be required to have a well-monitored fishers' register for taking stock of the fishers' population at any given time.

(iii) and (ix) Group (fishers) cohesion, cooperation, and leadership at the community level: Cooperation among all stakeholders, motivated by incentives, is crucial for the success of a co-management arrangement [10]. Lack of cooperation among stakeholders was one of the reasons for the failure of the current governance system at Lake Itzhi-Tezhi fishery. Incentives such as increased individual fish catches, high household income levels, low dependence on fishing, and decreasing numbers of immigrant fishers would be expected to enhance cooperation from the fishers. Incentives such as the reduced threat of overexploitation of the fishery's resources, increased compliance with regulations, and increased resources for enforcement and monitoring would also promote cooperation from the government.

To improve leadership, the FMC would be expected to organise capacity-building and knowledge transfer programmes for fishers through the proposed sub-committees in the fishing villages and fishing camps. These programmes (workshops and seminars) would have to cover topics such as responsibility, accountability, and effectiveness. Such programmes were also being recommended for the BMU for Lake Victoria, Kenya, after the experience of elite capture at the expense of the less educated local fishers [59].

(iv) Existing organisations (associations): The FFTA has been in existence since 2009. Because of its weak governance arrangement, it has not been effective in representing the fishers to other stakeholders on socio-economic matters. As such, the FMC would be expected to effectively represent the fishers on such matters. The proposed creation and inclusion of sub-committees in the co-management structure, apart from the FMC, would enhance effective representation and participation of fishers from the grassroots level.

(v) Benefits exceeding cost: The co-management system would be expected to provide benefits, especially at the fishers' household level [10]. Fishers would expect increased

fish catches, increased incomes, and improved livelihoods for their input into the co-management operations. This expectation is in line with Pomeroy and Rivera-Guieb's [10] argument that benefits from a co-management arrangement usually promote collective responsibility among fisheries resource users. That would also be an ideal situation in the governance of the Lake Itzhi-Tezhi fishery. Furthermore, the Fisheries Act (22 of 2011) [18] provides for the establishment of the Fisheries Development Fund for the FMC operations, including participation in law enforcement by fishers, and this would also enhance benefit realisation towards the fishers' livelihoods. However, government funding for co-management operations might not be reliable; additional sources, such as a portion of fishing licence fees, may be required for effective implementation [2].

(vi) Participation by those affected: The results of the current study show that all the stakeholders were negatively affected by the current state of governance and fisheries resources and were accordingly willing to participate in the co-management arrangement. Enactment of the Fisheries Act (22 of 2011) [18] was meant to incorporate fishers and other stakeholders in the decision-making processes of co-management. The incorporation of stakeholders is in line with the arguments proffered by Charles [60] and d'Armengol et al. [55] that engagement of a diversity of stakeholders in a co-management initiative of small-scale fisheries usually enhances the governance and management of fisheries resources.

(vii) Management rules enforced: To reduce unsustainable fishing practices, enforcement of or adherence to laws and regulations would be critical in co-management. According to Van Hoof [61], the success of co-management mainly depends on cooperation and collective action among participating stakeholders, particularly the fishers, in law enforcement. The proposed formation of sub-committees in the co-management structure would encourage fishers at the grassroots level to get involved since they know the lawbreakers and how to best deal with them. Furthermore, with the current limitation of human resources by the government to enforce the law, it would even be necessary to legally empower some fishers with the authority to apprehend and prosecute offenders. Such legal empowerment of fishers may require providing them with training and financial incentives, and this undertaking should be specified in the policy framework.

(viii) Legal rights to organise co-management: As far as the Lake Itzhi-Tezhi fishery is concerned, the Fisheries Act (22 of 2011) [18] provides a platform for stakeholders' participation in the governance process of fishery through the FMC. The presence of legislation is in line with d'Armengol et al. [55], who argue that a supporting legal and institutional framework is essential in facilitating the emergence of co-management. The same Fisheries Act of 2011 mandates the FMC to incorporate six fishers (to be selected through the proposed sub-committees) and at least seven other stakeholders of the fishery into its operations. However, most fishers were not aware of their legal right to participate in the prudent management of fishery's resources. As such, the fisheries policy would be required to elaborate on specific guidelines and responsibilities for fishers and the other stakeholders of the fishery in the co-management, including those responsibilities suggested in this study.

(x) Decentralisation of authority: Allison and Badjeck [62] argued that if empowering stakeholders in a co-management arrangement is the goal, then the process should be connected to the decentralisation of power and authority to the local community. However, the Fisheries Act (22 of 2011) [18] does not elaborate on how the government intends to decentralise its power and authority and transfer it to local fishers and other stakeholders. According to Pomeroy and Berkes [63], this lack of elaboration could be because the decentralisation of power was considered an evolving process that was adjusted and matured over time. Therefore, there was no better form of decentralisation, either delegation or devolution, to support a particular co-management [63]. Moreover, the government needs to develop more knowledge, experience, and political will to implement an appropriate form of decentralisation. This scenario is what usually breeds bureaucracy in the co-management implementation by the governments. However, based on the recommenda-

tion of Pomeroy and Berkes [63], the government of Zambia would have to give direction on the power-sharing and decision-making arrangements to participating stakeholders through the fisheries policy, which was not yet in place at the time of the current study.

(xi) Coordination between government and community: The establishment of the FMC, as demanded by the Fisheries Act (22 of 2011) [18], would play a pivotal role in coordinating the governance and management of the fishery, resolving conflicts, mobilising the enforcement of fisheries laws and regulations, and enhancing fishers' livelihoods. Its establishment would be done through engaging and mobilising all the stakeholders of the Lake Itzhi-Tezhi fishery.

5. Conclusions

Perceptions of key stakeholders at the Lake Itzhi-Tezhi fishery find co-management a feasible approach to advance. However, the co-management implementation and success would largely be dependent on the stakeholders' ability to align to the highlighted 'key conditions' criteria that would help to address the challenges and realise the benefits identified in this study.

When assessing the perceptions of the key stakeholders of the Lake Itzhi-Tezhi fishery, we find that most, if not all, of the 'key conditions' criteria are supposed to be met. This is because none of these 'key conditions' exists in isolation, but each one supports and links to another to make the process and arrangements for the success of co-management. However, the likelihood that not all the 'key conditions' would be fulfilled is also there, hence the need for the stakeholders to be prepared to relook at the 'key conditions' if such a thing happens.

Furthermore, there is a great need for the establishment of a fisheries policy to give guidelines on some aspects to enhance the success of the implementation of co-management. Developing such policy would need to be inclusive to key stakeholders, including the fishers, but with a clear mandate and anchoring in the recent fisheries legislation. This would define roles and mandates and would secure its legitimacy and the notion of ownership among the relevant actors. This study provides insights into what such policy needs would entail. One aspect is the establishment of the fisher-centred sub-committees in fishing villages and fishing camps to enhance decision-making by fishers on matters of socioeconomics, enforcement, monitoring, and conflict resolution around the fishery. The decentralised power authority and the suggested responsibilities for all the stakeholders of the fishery are additional aspects. The policy should explain the type of decentralisation to employ for the co-management arrangement and how to address the challenges in the implementation process. The type of decentralisation would either be devolution or delegation, depending on the capacities and capabilities of fishers and other stakeholders for each fishery. However, the delegation approach would be more appropriate, for a start, for the co-management at the Lake Itzhi-Tezhi fishery, considering the capacity of the fishers and the government seeking to achieve true co-management that joins forces with relevant stakeholders.

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